

ca

Possible errors in the determination of the heat of formation of cuprous oxide. I. A. Korchunov. J. Phys. Chem. (U. S. S. R.) 34, 194-8(1960). *Warten.* Warten's values, as well as other calorimetric values (C. A. Borg's values) are wrong because of the formation of other polymorphic forms. The best value of ΔH_{form} for α -Cu₂O is that obtained from c.m.f. measurements, i.e., -18,500 cal.
F. H. Rothmann

Cornell State Univ

ASS-SLA METALLURGICAL LITERATURE CLASSIFICATION

SOURCE SYMBOLS

QUALITY CODE

ISSUE DATE DAY MONTH YEAR

RECORDING UNIT ONLY ALL

DATE RECEIVED

KORSHUNOV, I. A.

CI

PROCESSES AND PROPERTIES INDEX

✓ Determination of chloride ion by polarographic titration. I. A. Korshunov and A. B. Gurevich (Gor'kiy State Univ., Zavodskaya Lab. 11, 848-51 (1945)). Mix 2-4 ml. of the sample soln. contg. Cl^- with 3-8 ml. of alc. to make the content of alc. at the equiv. point equal to 55-60%. transfer the soln. to an electrolyzer equipped with a tube for passing H_2 , and titrate with $\text{Pb}(\text{NO}_3)_2$ soln. of a concn. 2-3 times that of the Cl^- , pouring the titrating soln. into a microburet with its end immersed in the electrolyzer. A const. potential of approx. 0.9-1.1 v. is kept throughout the titration. Measure the diffusion current after each addn. of 0.1 ml. of the titrating soln. and mix the contents of the electrolyzer by a current of H_2 or some other gas. Plot the no. of ml. of $\text{Pb}(\text{NO}_3)_2$ used for the titration on the X-axis and the diffusion current on the Y-axis. A const. diffusion current indicates an excess of Cl^- in the soln. which binds the Pb ion in the ppt. Deviations from this position indicate the appearance of free Pb ion, i.e., the end of titration. A small excess of $\text{Pb}(\text{NO}_3)_2$ is added and a correction for the current due to the soly. of PbCl_2 is made by drawing a straight line parallel to the X-axis on the Pb wave in satd. PbCl_2 soln. from the horizontal region of the diffusion current to the intersection with the titration curve. The abscissa of this point corresponds to the no. of ml. of $\text{Pb}(\text{NO}_3)_2$ used to reach the equiv. point. $X = 58.46n/m$ (X is the content of NaCl in ml., n the titer of $\text{Pb}(\text{NO}_3)_2$ soln., n the no. of ml. of $\text{Pb}(\text{NO}_3)_2$ used, and m the no. of ml. of NaCl used for the analysis). W. R. Henn

Item 8 11

114

1ST AND 2ND YEARS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH YEARS

2

Visual instruments for polarographic analysis. I. A. Koryukov (Gor'ki Univ.). *Zashchita* Lab. 11, 734 6 (1965). Two kinds of visual polarograph, developed by the Sci. Chem. Research Inst. at the Gor'ki Univ., are described. W. R. Henn

ASR-ELA METALLURGICAL LITERATURE CLASSIFICATION

FROM SYNOPSIS

196000 02

196000 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

196000 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

ST AND THE CENTER										MET AND SYN. CRYSTALS									
PROCESSES AND PROPERTIES MORE																			
C A		<p>New models of visual polarographs. I. A. Korshunov and A. P. Kuznetsov (Omsk Univ.), <i>Zvezda</i> 1968, 12, 576-8 (1968); cf. C.A. 66, 2800. Two models of newly developed visual polarographs are described.</p> <p>W. R. Henn</p>																	
ASR-51A METALLURGICAL LITERATURE CLASSIFICATION																			
FROM SYNOPTIC										FROM SYNOPTIC									
CAPTURED 0.1										CAPTURED ONE ONE 101									

KORSHUNOV, I. A.

"Reduction of the Iodide Complexes of Lead and Mercury on a Mercury Drop Electrode."
N, J. Mal'ugina, and M. K. Shchennikova, and I. A. Korshunov (p. 1573)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1946, Vol. 16, No. 10

Sci. Res. Inst. Chem., Gorkiy State U.

KORSHUNOV, I. A. Dr. Chem. Sci.

Dissertation: "Certain Applications of the Polarographic Methods in Chemistry." Inst of General and Inorganic Chemistry imeni N. S. Kurnakov, Acad Sci USSR, 4 Jun 47.

SO: Vechernyaya Moskva, Jun, 1947 (Project #17836)

KORSHUNOV, I. A.

PA 36T17

USSR/Chemistry - Polarography
Chemistry - 2-Furaldehyde

Nov/Dec 1967

"Polarographic Determination of Furfurol," N. I.
Malyugina, I. A. Korshunov, Gor'kiy State University,
4 pp

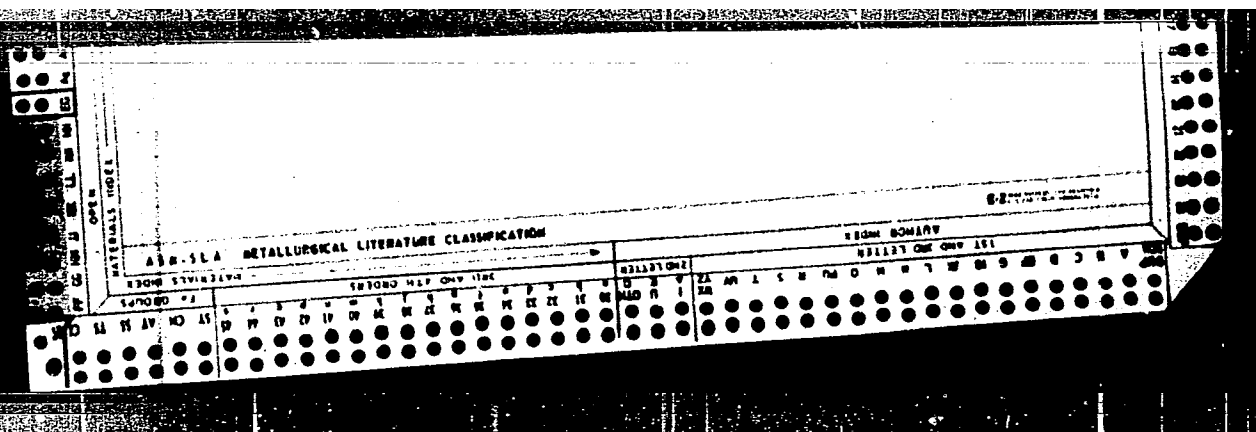
"Zhur Analit Khim" Vol II, No 6

The use of polarographic analysis is proposed for
quantitative determination of furfural. A method of
determining furfural in solutions and in furfural-
formaldehyde resin is developed. The accuracy of the
determination of furfural is $\pm 3.0\%$ relative, with a
considerable economy of time in the analysis.

LC

36T17

[illegible]



22

Polarographic determination of metals in used lubricating oils. I. A. Kuznetsov and M. K. Shchennikova. *Zhurnal Anal. Khim.* 13, 662-6 (1947) (in Russian).—Polarography is used as a quick method of analysis for Cr, Fe, Sn, Pb, and Cu in used lubricating oils. **Cr detn.:** To 50 ml. of sample add 1-2 g. NH_4Cl , heat, add concd. NH_4OH in small increments until a brown ppt. appears, filter, transfer the filtrate to a 100-ml. measuring flask. Wash the ppt. with H_2O ; combine washings with filtrate and dil. to 100 ml. Polarograph a 5-10-ml. sample at 0.2-1.2 v. in H atm. **Fe, Sn, and Pb detn.:** Dissolve on the filter with 30 ml. hot 2 N HCl the ppt. obtained after adding NH_4OH in the Cr detn.; wash with H_2O and dil. the filtrate to 50 ml. The presence of Cu is insignificant. A sample polarographed at 0.4-0.6 v. in H atm. results in a reading for Fe, Sn, and Pb. Add cryst. $\text{K}_2\text{Fe}(\text{CN})_6$ to ppt. Fe. Polarograph the sample. The difference in readings is a measure of the amt. of Fe present. **Detn. of Pb and Sn:** To 10 ml. of soln. contg. Fe, Sn, and Pb add 10 ml. concd. H_2SO_4 and evap. to a small vol.; add 50-60 ml. cold H_2O and 5-6 ml. concd. HCl to prevent hydrolysis of Sn salt. Add 10 ml. of 2 N $(\text{NH}_4)_2\text{CO}_3$ and concd. NH_4OH until faintly alk., heat to boiling, and filter. Wash the pptd. $\text{Sn}(\text{OH})_2$ on the filter with 0.5 N $(\text{NH}_4)_2\text{CO}_3$, and add washings to the filtrate. Evap. to 10-15 ml., dil. with 30 ml. 2 N HCl, and make up to 50 ml. with H_2O . Polarograph the soln. contg. Pb in a H atm. **Det. Sn** by dissolving $\text{Sn}(\text{OH})_2$ ppt. with 30 ml. of 2 N HCl; dil. the filtrate to 50 ml. Polarograph the soln. in a H atm. **Cr detn.:** neutralize a 10-ml. sample with approx. 0.5 g.

Na_2CO_3 . Displace Cu in soln. by boiling with 0.5 g. Zn dust. Filter. Place the filtrate in a 25-ml. measuring flask. Wash the residue with dil. HCl and H_2O . Introduce SO_2 in Cu-free soln. After adding 5 ml. of Zn amalgam and agitating, polarograph the soln. at 0.2-1.0 v. in H atm. **Det. hexivalent Cr** in an alk. medium using Rochelle salt to retain Fe in soln. To 20 ml. sample add 10 ml. of 0.5 mol. soln. of Rochelle salt, 50 ml. of 4 N KOH soln., and 20 ml. of satd. bromine water. Boil, evap. to 50 ml. Polarograph a portion of the sample in H atm. Read the Cr content from a known graph in which a standard Cr soln. in 1 N KOH and 1 mol. Rochelle salt soln. is polarographed at 0-1.4 v.

Clarence A. Fiesher

Polarographic analysis of zinc-plating baths. 1. A. Koshunov and L. N. Bazanova. *Zavodskaya Lab.* 13, 1173-5 (1947).--A 1-ml. sample is treated with 25% NH_4OH until clear, then 15 ml. 2 N NH_4Cl is added and the vol. adjusted to 100 ml. A 1 ml. aliquot is placed in the polarographic cell (contg. equal parts N NH_4OH and N NH_4Cl). The concn. of the Zn is estd. graphically as usual. Titration of the soln. by N $\text{Pb}(\text{NO}_3)_2$ is best done in the presence of BrOH and shows a clean break at the end point for the sulfate ion; a 3-ml. sample is placed in the vessel, 2 ml. BrOH added, and the tip of the buret with N $\text{Pb}(\text{NO}_3)_2$ soln. is dipped below surface; after 0.8 v. potential is applied, titration is conducted and the end point is shown by the break caused by increase of the diffusion current. Cu and Pb can be estd. by usual polarography. Fe is best detd. colorimetrically. G. M. K.

ASB 55.4 - METALLURGICAL LITERATURE CLASSIFICATION

KORSHUNOV, I. A.

Reduction of furfural on the dropping mercury cathode.
 V. A. Korshunov and S. A. Ermolaeva (Gor'ki Chem. Research Inst.). *J. Gen. Chem. (U.S.S.R.)* 17, 181-4 (1947) (in Russian).—Two distinct polarographic waves were found at each pH, between 4 and 7.25. In the 1st wave, the diffusion current intensity i_1 falls with rising pH. In the 2nd wave i_2 rises with pH. The 1st half-wave potential, π_1 , rises with pH; the 2nd, π_2 , falls initially, then remains const. Example of data (at $14^\circ \pm 0.6^\circ$): pH 4.00, 5.82, 6.50, $i_1 = 53.0, 28.2, 3.0$ microamp.; $\pi_1 = 1.24, 1.42, 1.52$ v.; $i_2 = 10.2$ (pH 5.5), 22.8, 55.6; $\pi_2 = 1.78$ (pH 5.5), 1.74, 1.72 v. The ratio $K = i_2/i_1[H^+]^2 = \text{const.} = 0.50 \times 10^{12}$ (av.); K varies somewhat with the concn. of the furfural. The occurrence of the two waves cannot be ascribed to a keto-enol tautomerism. On the basis of the dependence of π on the concn. of the furfural, the reduction is irreversible, according to $C_5H_4O.CHO + 2H^+ + 2e \rightarrow C_5H_4O.CH.OH$.
 N. Thou

COMMON ELEMENTS		COMMON ALLOYS		COMMON COMPOUNDS		COMMON PROCESSES AND PROPERTIES INDEX	
<p>Polarographic study of some mercury ion complexes in solution. M. K. Shchennikova and I. A. Kreshunov (State Univ., Gorkii). <i>J. Phys. Chem. (U.S.S.R.)</i> 21, 215-18(1947) (in Russian).—Anodic polarization of a dropping-Hg electrode in solns. of NH_4 citrate (I) and of Seignette salt (K Na tartrate) (II) results in formation of insol. complexes of Hg^{++}. The height h of the anodic wave in a soln. of $\text{N KNO}_3 + 0.5 \text{ NI} + \text{Hg}(\text{NO}_3)_2$ increases linearly with the concn. of Hg^{++}; apparently Hg^{++} gives Hg_2^{++} at the metal surface, and Hg_2^{++} is oxidized by the current. h is proportional to the concn. C of I between 0.2 and 0.7 N. The half-wave potential is $0.265 - 0.065 \log C$ for I and $0.248 - 0.11 \log C$ for II, referred to $N \text{ Hg}_2\text{Cl}_2/\text{Hg}$ electrode. No limiting anodic current can be obtained in KI solns. The cathodic wave is not similar to the anodic; this shows that the electrode processes are irreversible. The cathodic h is almost independent of C. The half-wave potential is $0.260 - 0.104 \log C$ for I; $-0.218 - 0.108 \log C$ for II; and $-0.462 + 0.126 \log C$ for KI. The coordination no. is 2 for both I and II, and 4 for KI. The comp. formed from Hg and KI is, consequently, K_4HgI_6.</p>							
<p>ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>							
<p>151 AND 152 GROUPS</p>							

1ST AND 2ND CROSSL																										3RD AND 4TH CROSSL																									
PROCESSES AND PROPERTIES INDEX																																																			
15																																																			
<p>Polarographic Determination of Nitrobenzene. (In Russian.) I. A. Korshunov and others. <i>Zavodskaya Laboratoriya</i> (Factory Laboratory), v. 13, July 1948, p. 519-522.</p> <p>The effects of concentration, temperature, gelatinous contents, and other factors on the diffusion current of nitrobenzene is investigated; a quantitative analysis of nitrobenzene in aqueous solutions and in aniline, benzidine, and dinitrobenzene mixtures is obtained using the polarographic method.</p>																																																			
<p><i>Eor. Kiyatok Hivis Se. Res. Inst. Chem.</i></p>																																																			
<p>ASN-31A METALLOGICAL LITERATURE CLASSIFICATION</p>																																																			
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1ST AND 2ND ORDERS										PROCESSES AND PROPERTIES INDEX										123 AND 6TH LETTERS									
<p style="text-align: right;">15</p> <p>Direct Polarographic Determination of Copper and Lead in a Nickel Electrolyte. (In Russian.) I. A. Korshunov and L. N. Samanova. <i>Zavodskaya Laboratoriya</i> (Factory Laboratory), v. 13, July 1948, p. 621.</p> <p>Proposes the polarographic determination of copper and lead in a nickel electrolyte previously treated with small amounts of hydrogen peroxide and sodium to destroy organic conditions and cause iron to precipitate.</p>																													
METALLURGICAL LITERATURE CLASSIFICATION																													
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Polarographic Determination of Zinc in a Pison Alloy.
 (In Russian.) I. A. Korshunov and I. I. Malyugina.
 Zavodskaya Laboratoriya (Factory Laboratory), v.
 13, July 1948, p. 622.

The main characteristic of the proposed method is
 the use of an alkaline solution, permitting the
 desired determination without aluminum separa-
 tion.

ASSOCIATE METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

5TH AND 6TH ORDERS

7TH AND 8TH ORDERS

9TH AND 10TH ORDERS

11TH AND 12TH ORDERS

13TH AND 14TH ORDERS

15TH AND 16TH ORDERS

17TH AND 18TH ORDERS

19TH AND 20TH ORDERS

21ST AND 22ND ORDERS

23RD AND 24TH ORDERS

25TH AND 26TH ORDERS

27TH AND 28TH ORDERS

29TH AND 30TH ORDERS

31ST AND 32ND ORDERS

33RD AND 34TH ORDERS

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37TH AND 38TH ORDERS

39TH AND 40TH ORDERS

41ST AND 42ND ORDERS

43RD AND 44TH ORDERS

45TH AND 46TH ORDERS

47TH AND 48TH ORDERS

49TH AND 50TH ORDERS

51ST AND 52ND ORDERS

53RD AND 54TH ORDERS

55TH AND 56TH ORDERS

57TH AND 58TH ORDERS

59TH AND 60TH ORDERS

61ST AND 62ND ORDERS

63RD AND 64TH ORDERS

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69TH AND 70TH ORDERS

71ST AND 72ND ORDERS

73RD AND 74TH ORDERS

75TH AND 76TH ORDERS

77TH AND 78TH ORDERS

79TH AND 80TH ORDERS

81ST AND 82ND ORDERS

83RD AND 84TH ORDERS

85TH AND 86TH ORDERS

87TH AND 88TH ORDERS

89TH AND 90TH ORDERS

91ST AND 92ND ORDERS

93RD AND 94TH ORDERS

95TH AND 96TH ORDERS

97TH AND 98TH ORDERS

99TH AND 100TH ORDERS

POLAROGRAPHIC DETERMINATION OF COPPER IN PEAT ASH
 L. A. Koryshnyy and L. N. Sazanova (Gorky State Univ.
 S.S.R.), Zashchitaya Lab. 14, 218 (1948). Ash 10.15
 g. of peat with good access of air, cool, boil with 5 ml
 7.6 N HNO₃, and neutralize with concd. NH₄OH, to
 ppt. Fe completely. Cool to room temp., dil. to 50 ml
 with N NH₄OH soln., decant 5 ml. of clear soln. into an
 electrolyzer, pass H₂ through the soln., and det. polaro-
 graphically. Then add 0.1 ml. of 0.01 N Cu soln., pass
 in H₂ for 5-10 min., and det. again. Det. the Cu content
 from polarograms; it is also possible to do this from a
 calibration curve. If a max. appears on curves, add
 0.3-0.5 ml. of 10% gelatin soln. H. Z. Kamich

ASH-56A METALLURGICAL LITERATURE CLASSIFICATION
 SYMBOLS: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

PA 1/18/127

KORSHUNOV, I. A.

USSR/Electricity
Potentiometer
Electrolytic Potentials

Apr 48

"Potentiometer for Electrometric Work," I. A. Korshunov, A. P. Rostokin, Chem Inst, Gor'kiy State U,
1 p

"Zavod Lab" Vol XIV, No 4 -pp.502-3

Describes apparatus with circuit diagram and photograph. It is intended for compensation measurement of EMF up to 1 volt, which is usually adequate for potentiometric titration, measurement of pH value, and control of cathode potential during electrolytic precipitation.

4/49727

1ST AND 2ND CODES		PROCESS AND PROPERTIES INDEX		3RD AND 4TH CODES	
A		7			
<p>Polarographic determination of nitrobenzene. I. A. Koshinov, A. V. Ryskov, L. N. Sazanova, and A. S. Kiseleva. <i>Zashchita Lab.</i> 14, 510-22(1948); cf. C.A. 43, 4886a. Nitrobenzene can be detd. polarographically in aq. solns., in aniline, in benzidine, and also mixed with dinitrobenzene. Reduction of nitrobenzene occurs in acid, neutral, and alk. solns. and the form of the wave in all cases is suitable for measurement. The potential of the semi-wave of the reduction of nitrobenzene is affected by the pH of the buffer soln. only in the acid range. There is no directly proportional relationship between the diffusion current and the concn. of the nitrobenzene. The temp. coeff. of the diffusion current of nitrobenzene is about 1.5% for each degree and depends linearly upon the temp. Hence, the temp. of the test soln. must be maintained const. within 0.5-1.0°. For concns. of nitrobenzene of 10^{-4} mol./l. and higher, max. are formed which interfere with the measurements. The addn. of gelatin depresses the max. and moves the potential of the semiwave to the neg. side. For detns., the nitrobenzene is dissolved in alc., acetone, or dioxane and the resulting soln. is added to the buffer in the electrolyzer in such amts. that the concn. of the nitrobenzene should not exceed $10^{-4} - 2 \times 10^{-4}$ mol./l. It is necessary to compensate the non-Faraday current and to expel the dissolved O beforehand. The latter is done by passing an inert gas through the buffer soln. before the sample is added. For concns. of about 10^{-4} mol./l. the detn. can be made with an error of 2-3%. Detns. of small amts. of nitrobenzene in the presence of aniline or benzidine were made by mixing the test soln. with 1 vol. of concd. HCl and 4 vol. of aniline or 2 vol. benzidine and 1 vol. HCl and then polarographing. Calen. were made from a curve showing diffusion current in microamps. against % nitrobenzene in aniline. The curve was constructed from standard solns. of nitrobenzene in aniline which did not contain nitrobenzene. Acid solns. contg. nitrobenzene and in which the HNO₃ concn. is not over 1.0-1.5 N can be detd. directly without the addn. of a buffer.</p> <p style="text-align: right;">B. Z. Kouch</p>					
<p>ASB-ELA METALLURGICAL LITERATURE CLASSIFICATION</p>					
<p>10000 01 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100</p>					

KORSHUNOV I. A.

USSR/Metals

May 1948

Polarographic Analysis
Electrolytes

"Direct Polarographic Determination of Copper and Lead in a Nickel Electrolyte," I. A. Korshunov and L. N. Sazanova, Inst Chem, Gorkiy State U, 1 p

"Zavod Lab" Vol XIV, No 5 - p. 621

Copper waves are masked by diffusion wave. This difficulty can be overcome by treating nickel electrolyte with a small amount of hydrogen peroxide and soda, which splits up organic compounds and precipitates iron.

7586

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11

concentrations Determination of Zinc in [Aluminium] Piston Alloy. I. A. Kuznetsov and N. I. Malyugin (*Zavod. Lab.*, 1948, 14, (5), 622). [In Russian]. 0.2-0.3 g. of the alloy is carefully dissolved in the minimum quantity of 6N NaOH, added drop by drop, and additional NaOH solution is then run in in such quantity that when the measuring flask is made up to the mark with distilled water the final concentration of NaOH is approx. 2N. 5 ml. of the alkaline solution is transferred to an electrolyser, some crystals of sulphite added, and photoregraphing on the ... The Zn content is estimated from a standard curve based on the ... of alloys containing known amounts of Zn. The curve does not exceed ... 7%, and the procedure is 3-4 times more rapid than the gravimetric method.—N. B. V.

Instr. Chem., Gor'kiy State Univ.

ASU-SLA METALLURGICAL LITERATURE CLASSIFICATION

ADONIS 0013-788X(1988)0001-0001

ARTICLE NO. 1

CITATION

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

PA 8/49754

USSR/Chemistry - Benzene, Nitro
Chemistry - Polarography

May 48

"Polarographic Studies of Nitrobenzene," I. A.
Korshunov, A. B. Kirillova, Gor'kiy Sci Res
Inst of Chem, Gor'kiy U, 7 pp

"Zhur Obshch Khim" Vol XVIII (LXXI), No 5

Report experiments. Studied reduction of nitro-
benzene on mercury drop cathode for various
concentrations and pH values. Discovered two
degrees of reduction of nitrobenzene in acid media.
Established that reduction potential is represented
by polarographic wave equation which holds good
for reversible process. Showed that half-wave
8/49754

USSR/Chemistry - Benzene, Nitro (Contd)

May 48

reduction potential of nitrobenzene becomes negative
with increase of pH and obeys the law $\eta' \frac{1}{2} = \text{const}$.
-a pH, where a = 0.061 for acid solutions and 0 for
alkaline. The alteration of the half-wave potential of
nitrobenzene due to changes in concentration is
insignificant. Suggests scheme for the intermediate
reduction reactions of nitrobenzene into aniline in
acid and alkaline solutions. Investigated effect of
gelatin on the half-wave potential and diffusion
current of nitrobenzene. Submitted 22 Oct 1946.

KORSHUNOV, I. A.

8/49754

PRINCIPAL AND PROPERTY INDEX																									
<p><i>Ch</i></p> <p>Vapor pressure of methyl acrylate. S. A. Kuznetsov and I. A. Kuznetsov (Leningrad State Univ.) <i>J. Applied Chem. (U.S.S.R.)</i> 21, 389 (1948) (in Russian). - Meas. accurate of the vapor pressure p of $\text{CH}_2=\text{CHCO}_2\text{CH}_3$, freed from dissolved gases by 2 hrs. evacuation, and thus rendered relatively stable against polymerization in the given temp. range, were made between 10 and 60° ($\pm 0.3^\circ$). Selected points (read from graph): 20, 30, 40, 50, 60°, p = 18, 37, 64, 92, 130 mm. Calcd. heat of vaporization = (16.5) cal./mole, extrapolated to 0.5°. Trouton's const. 25.8. N. Thou</p>																									
<p>ASB-55A METALLURGICAL LITERATURE CLASSIFICATION</p>																									
<p>13000 51002100</p>													<p>13000 51002100</p>												
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KORSHUNOV, I.A.

PA 67T20

USSR/Chemistry - Reduction
Chemistry - Quinoline Derivatives

Apr 1948

"Reduction of Pyradine, Quinoline and Derivatives of
Quinoline in Mercury-Drop Electrodes," M.K.
Shchemnikova, I.A. Korshunov, Gor'kiy State U, 9 pp

"Zhur Fiz Khim" Vol XXII, No 4 *pp 503-12*

Determine that character of the reduction and depth
of hydrogenation is greatly dependent on the con-
centrations of hydrogen ions in solution. Reduc-
tion of quinoline and o-oxyquinoline on mercury-drop
electrode shows decrease of overvoltage. Submitted
27 Jun 1947.

67T20

Use of a dropping-mercury microelectrode in titration.
A. Korshunov. *Trudy Khimich. Anal. Khim., Otdel.*
Khim. Nauk, Akad. Nauk S.S.S.R. 2, (5), 96-112 (1949).
M. Hosh
--Review with 3) references.

CA

Visual and photo-registering apparatus for polarographic
analysis. 1. A. Korshunov. *Trudy Komissii Anal.*
Khim., Otdel. Khim. Nauk, Akad. Nauk S.S.S.R. 2,
(5), 121-32(1949).—Description of several kinds of
U.S.S.R.-made polarographs. M. Hoseh

KORSHUNOV, I. A.

Chemistry - Polymers
Chemistry - Iron, Electrolysis

1949

"A Polarographic Characteristic of Several Inorganic Ions," I. A. Korshunov, N. E. Kobzhnikova, 801 Mos-
kovskiy State U., 8/3/49, pp.

"Dokl. Akad. Nauk SSSR," Vol. 17, No. 1

Data characterizes the reduction of ions of inorganic
anions on a mercury drop electrode using electro-
lysis of different composition. Describes base solu-
tion most suitable for quantitative determination
of ions of hydrogen and hydroxyl ions, nitrate,
nitrite, nitroxy, inorganic arsenic, magnesium, iron,
vanadium, molybdenum, and tungsten, and for various acid
ions. Graph tables show composition of media. In-
cludes graphs of anodic waves. Submitted 3 Apr 49.

29/Agro

KORSHUNOV, I. A.

USSR/Chemistry - Reduction, Electro-Polarography

Nov 49

"Polarographic Determination of Phtalimide, Isatin, Dioxindole, and Indigocarmine,"
I. A. Korshunov, L. N. Sazanova, M. K. Shekhanikova, O. P. Malkova, Inst of Chem,
Gor'kiy State U, 3 1/2 pp

"Zovad Lab" No 11

Shows that all subject compounds can be reduced on the mercury-drop cathode.
Phtalimide can be determined quantitatively only in acid solution, while isatin
and dioxindole, in alkaline solution as well. Indigocarmine can be determined in
mediums of any pH value. Includes two graphs.

PA 153T12

CA

Polarographic determination of phthalimide, isatin, diospyrindole, and indigocarmine. I. A. Koshunov, L. N. Sazonova, M. K. Shchennikova, and O. P. Malkova (State Univ., Gorki). *Zavodskaya Lab.* 13, 1287-91 (1949).—Phthalimide is detd. in aq. solns. (buffers at pH about 8 or 0.1-1.0, VHCl) with a half-wave potential at -0.7 v. Isatin can be detd. in acid or alk. solns. with a half-wave potential at pH 2.64 of -0.24 v., while in alk. solns. (0.1-1.0 N NaOH) the half-wave potential is -1.45 v. Diospyrindole undergoes transformations at pH above 4 giving varying wave-forms with time; at pH 2.64 its half-wave potential is -0.29 v. Indigocarmine gives stable waves at pH 1.5-11.0; half-wave potential varies with concn.: at pH 2.64 it is -0.24 v. at 4 millimolar concn. and -0.4 v. at 30 millimolar.

G. M. Kosolapoff

Inst Chemistry

KORSHUNOV, I. A.

36599. KORSHUNOV, I. A., KUZNETSOVA, Z. B. i SHCHERBKOVA, K. K. Vosstanovleniye Slabykh Kislot Na Rtutnom Kapel'nom Katode. Zhurnal Fiz. Khimii, 1949, Vyp. 11, c. 1292-98.

SO: Letopis' Zhurnal'nykh Statey, Vol. 50, Moskva, 1949

KORSHUNOV, I. A.

36598. KORSHUNOV, I. A. i SAZANOVA, L. N. Vosstanovleniye O - , M - i R- Nitro-benzal'degidov Na Rtutnom Dapel'nom Katode. Zhurnal Fiz. Khimii, 1949, Vyp. 11, c. 1297-304.

SO: Letopis' Zhurnal'nykh Statey, Vol. 50, Moskva, 1949

Chair Inorganic Chem., Gorkiy State Univ

KORSHUNOV, I. A.

37211. KORSHUNOV, I. A. IKHRUL'KOVA, YE. P. Polyarograficheskoye issledovaniye kompleksov tsinka s gidroksilom. Zhurnal Obshchey Khimii, 1949, VBP. 11, s. 2045-47

SO: LETOPIS' ZHURNAL'NYKH STATEY, VOL 7, 1949

CA

Polarography of iron in aluminum sulfate. I. A. Kor-
shunov and O. P. Malkova (Gorki State Univ., Zh-
bzdikova Lab. 18, 1360(1040).—Acid solns. (HCl or H-
NO₃) give satisfactory results if the Al concn. is kept within
0.2-0.3 N. Relative error is 1.5-2.6%. G. M. K.

Composition and instability constant of the complex
lead tetrakis ion. I. A. Kopylov and V. A. Osipova
(Mosk. State Univ.). J. Gen. Chem. U.S.S.R. 19. No.
10, 2385-73 (1960) (English translation). See C.A. 44,
4137. B. J. C.

Chair Inorg. Chem.

CA

Conjugation and instability constant of the complex
mercury diacetylide ion. I. A. Koryunov and M. K.
Shchegoleva (Orel State Univ.). J. Gen. Chem.
U.S.S.R. 19, No. 10, 2272-4 (1949) (English translation).
—See U.A. 48: 9084. E. J. C.

KORSHUNOV, I. A.

7

Chem

Polaronic investigation of complexes of zinc and the
hydroxyl ion. I. A. Korshunov and G. E. Gerasimova.
(Gorkii State Univ.). J. Gen. Chem. U.S.S.R. 19, No.
11, 2613-16 (1940) (Engl. translation).—See C.A. 44,
4364a. E. J. C.

CA

Composition and instability constant of complex lead
iodide. I. A. Karginov and V. A. Osipova. Zhur.
(Doklady Akad. Nauk SSSR) 10, 1810-1812 (1969).
From e.m.f. measurements of the concn. cell Pb/Pb^{2+} with
(-)/satd. $KNO_3/Pb^{2+}(c_1) + KI$ (activity a_2)/ Pb , with
 c_1 (M) = 0.01, 0.02, 0.05, 0.1, 0.2, 0.5, and 1.0
const. $K_1 = [Pb^{2+}][I^-]^2/[PbI_2]^{-1}$, at 0, 25, 30, and 35°
 $\times 10^{-4}$, resp. The const. $K_2 = [Pb^{2+}][I^-]^2/[PbI_2]^{-1}$
varies with a_2 , e.g., $a_2 = 0.90, 1.25, 2.00, 3.90, 4.00$,
 $\times 10^{-4}$, resp. at 25°, $K_2 = 2.19 \times 10^{-2}$; at 30°, $K_2 = 1.49 \times 10^{-2}$; at
35°, $K_2 = 1.43 \times 10^{-2}$. Variations of K_1 with
 a_2 are smaller. The conclusion is that in KI solns. above
1M, the main complex present is PbI_4^{2-} . Its dissociation
const. is in agreement with that detd. by Kuznetsov
(C.A. 40, 7024) from soly., but is considerably higher
than the value given by Lanford and Kiehl (C.A. 35,
2773). From the temp. dependence of K_1 , the heat of
formation of the complex is about 60 kcal./mole.
N. Thon

2

CA

Composition and instability constant of complex mer-
curic thiocyanate. I. A. Kabanov and M. K. Nischen-
nikov. *Zhur. Obshch. Khim.* (J. Gen. Chem.) 19,
1820-1(1948).--By polarographic detn., the half-wave
potential for the reaction $\text{Hg}^{++} + 4\text{CNS}^- \rightleftharpoons [\text{Hg}(\text{CNS})_4]^{--} + 2\text{H}_2$ at the Hg-drop electrode, is $E_{1/2} =$
 $-0.188 - 0.125 \log(\text{CNS}^-)$, between 0.2 at 1.2 N
KCN. The slope 0.125 is close enough to the theoreti-
cal 0.116 for the coordination no. 4 to justify the formula-
tion $[\text{Hg}(\text{CNS})_4]^{--}$. With the known dissoc. const.,
 $K = 5 \times 10^{-12}$, for the $[\text{HgI}_4]^{--}$ complex, the half-wave
potential for $\text{Hg}^{++} + \text{Hg} \rightleftharpoons \text{Hg}_2^{++}$ in 0.1 N KNO_3 , in
the absence of complex formation, is calcd. to be +0.387 v.
(relative to satd. calomel). Hence, the dissoc. const. of
 $[\text{Hg}(\text{CNS})_4]^{--}$ is 5×10^{-12} at 18°. N. Thon

CA

Polarographic investigation of complexes of zinc and the hydroxyl ion. I. A. Korshunov and E. P. Khrul'kova (Gor'kov. Gosudarst. Univ., 2888, Obshch. Khim. (J. Gen. Chem.) 19, 2045-7 (1940).—Solns. of $ZnSO_4$ in the presence of 0.01 N Na_2SO_4 and varying concn. (0.2-3 N) of $NaOH$ were studied polarographically. The concn. of Zn was 0.001 N. The reduction of Zn in solns. more alk. than 2.0 N shows a reduced wave rounded at the top. For these solns. the polarographic wave equation $\varphi = \varphi_{1/2} - (2.3 RT/nF) \log (i/(i_d - i))$, where $\varphi_{1/2}$ is the half-wave potential at $i = 1/2 i_d$, does not apply in its simple form. Measurements were made at 0, 20, and 30° with a dropping-Hg electrode. For alkali concns. from 0.1 to 1 N, the equation $(\varphi_{1/2})_s = -\varphi^{\circ} - 0.09 \log A_{OH^-}$ applies, where $\varphi^{\circ} = 1.455, 1.460$, and 1.463 for temps. of 0, 20, and 30°, resp. For concn. 1.1 to 2.0 N $(\varphi_{1/2})_s = -\varphi^{\circ} - 0.12 \log A_{OH^-}$, where A_{OH^-} is the activity of the OH^- , and $\varphi^{\circ} = 1.157, 1.462$, and 1.466 . Comparison with the half-wave potential equation applicable to complex-forming compds. $d(\varphi_{1/2})_s/d \log OH^- = -p \cdot 2.3 (RT/nF)$ indicates a value of the coordination number between 3 and 4. The dissociation consts., were detd. at 0, 20, and 30° by means of $(\varphi_{1/2})_s = (2.3 RT/nF) \log k_s - p \cdot 2.3 (RT/nF) \log A_{OH^-}$, where $(\varphi_{1/2})_s = 1.30$ v. From the values obtained for the temp. coeff., the heat of activation is 18,000 kilocalories.

A. Leviton

Reduction of benzaldehyde and *p*-dimethylaminobenzaldehyde at a dropping-mercury cathode. I. A. Korshunov and L. N. Sazanova. *Zhur. Fiz. Khim.* (J. Phys. Chem.) **23**, 202-8(1949).---Polarography of BzH solns. in H₂O 70, EtOH 30% in the presence of phosphate-citrate buffers showed 2 waves between pH 2.0 and 6.0 and one wave at pH > 6.2. The 2nd wave was relatively greater the greater the concn. *c* of BzH and remained alone at pH > 6.2. The diffusion current was proportional to *c* between 4×10^{-5} and 10^{-3} mol./l. The electrode reaction involves 2 electrons, i.e. that BzH is reduced to PhCH₂OH, contrary to Tokunaka (*C.I.* **30**, 10066). The half-wave potentials depended on pH, were more neg. when *c* was greater, and did not vary between 0° and 15°. *p*-Me₂NC₆H₄CHO showed 2 waves between pH 5.0 and 6.7, and one wave outside this range. The diffusion current at pH > 6.7 was about 1/2 that at pH < 5. The half-wave potentials depended on pH, increased with *c*, and decreased by 0.2 v. when the temp. rose from 0° to 15°. The 2 waves observed for both compds. may correspond to the reactions $\text{RCHO} + 2 \text{H}^+ + 2 e \rightarrow \text{RCH}_2\text{OH}$ and $\text{RCHO} + 2 \text{H}_2\text{O} + 2 e \rightarrow \text{RCH}_2\text{OH} + 2 \text{OH}^-$.

J. J. Bikerman

CA

4

Reduction of weak acids at a dropping-mercury cathode.
 L. A. Korshunov, Z. B. Kuznetsova, and M. K. Shchen-
 nikova (Gorkov. Gosudarst. Univ., Gorki). *Zhur.*
Fiz. Khim. 23, 1202 (1949). The half-wave potentials
 $V_{1/2}$ referred to sat'd. HgCl/Hg electrode, increase (i.e.
 become more neg.) when the concn. of the acid (in milli-
 mol./l.) increases. At 25° $V_{1/2}$ is for HCO₂H 1.74-1.85
 (1-10 millimol./l.), AcOH 1.76-1.86 (2-15), isobutyric
 1.81-1.87 (3-25), isovaleric 1.75-1.82 (4-27), CH₃CICO₂H
 1.65-1.71 (1-10), CHCl₂CO₂H 1.55-1.64 (1-5), CHCl₂-
 CO₂H 1.57-1.68 (1-8), pyruvic 1.80-1.86 (1-10), BrOH
 1.86-1.72 (1-8), PhCHOHCO₂H 1.70-1.78 (2-13),
 gallic 1.71-1.73 (2-6), salicylic 1.66-1.83 (1-9), and
 acetylsalicylic acid 1.52-1.65 (1-7), if the soln. is 0.05 *N*
 in respect to Me₄Ni. Polybasic acids also have only one
 wave; $V_{1/2}$ is for (CO₂H)₂ 1.66-1.80 (1-8), malonic 1.69-
 1.74 (2-13), tartaric 1.64-1.77 (1-8), citric 1.64-1.77
 (1-8), male 1.66-1.74 (1.5-10), succinic 1.80 (1-9), and
 adipic 1.76-1.80 v. (2-11). Phthalic acid shows 2 waves.
 $V_{1/2}$ values are recorded also for anthranilic, sulfanilic, and
 naphthionic acids in alc. Me₄Ni and for *p*-H₂NC₆H₄SO₃-
 NaAc, sulfathiazole, and *p,p'*-H₂NC₆H₄SO₃ and NH₂C₆H₄-
 SO₃Na, in aq. Me₄Ni. H₂SO₄, sulfidine, and sulfanil-
 amide are not reduced. All these polarographic waves
 are due to discharge of the H ion. This is shown by their
 absence in very acid (when the wave coincides with that of
 the supporting electrolyte) and in alk. solns. (in which the
 H-ion concn. is too low). If J is the diffusion current
 and C the concn. of the org. acid, $J/C = a - bx$, in which
 x is $-\log K$, K is the disson. const. of the acid (or the
 first disson. const. of polybasic acids). a and b are
 const. depending on the nature and concn. of the sup-

*Chin. Inorganic
 Chemistry*

PA 47/49T12

KORSHUNOV, I. A.

USSR/Chemistry - Electrolytic Reduction Feb 49

"Reduction of Benzaldehyde and p-Dimethylamino-benzaldehyde in a Mercury-Drop Cathode," I. A. Korshunov, L. N. Sazonova, Sci Res Inst of Chem, Gor'kiy State U, 7 pp

"Zhur Fiz Khim", Vol XIII, No 2 7p. 1294-1304

Investigated subject reductions for a wide pH range. Established that nature of reduction depends upon structure of entire molecule, and end products of reductions are the corresponding alcohols. Advances a supposition explaining appearance of two stages in the diffusion wave by

47/49T12

USSR/Chemistry - Electrolytic Reduction Feb 49
(Contd)

addition of hydrogen from solutions and electrons from the cathode. Submitted 22 May 48.

47/49T12

Polarographic determination of aromatic ketones and aldehydes. I. A. Korshunov, Z. B. Kuznetsova, L. N. Sennova, and A. S. Kirillova (Gorki State Univ.). *Zashchita Lab.* 16, 144-6 (1960). - For AcPh, PhCO, *p*-Me₂NC₆H₄CHO, and BzH only one diffusion wave is seen in acid solns, but raising the pH from 3 to 6 brings up a 2nd wave, which is the only one left when the pH rises above 6. Cinnamaldehyde gives also a 3rd wave which is present at all pH values and changes from -1.40 v. half-wave potential at pH 2.93 to -1.21 v. at pH 9.65. The half-wave potential (against satd. calomel electrode) is as follows: for AcPh -1.07 and -1.6 v.; PhCO -1.1 and 1.45; BzH -1.0 and -1.35; *p*-Me₂NC₆H₄CHO -0.96 and -1.65; PhCH:CHCHO -0.90 and -1.84 v., resp. Polarographic detns. of these substances are readily performed when alc. solns. of the materials are used, since their soly. in H₂O is poor; 0.1-1.0 N HCl may be satisfactorily used as the solvent in such cases.
G. M. Kosolapoff

CA

Polarographic investigation of complexes of copper with pyridine. J. A. Korshunov and N. I. Malyugina (State Univ., Gorki). *Zhur. Obshchei Khim.* (J. Gen. Chem.; 20, 402-6 (1950)).--Polarographic curves are shown for Cu in its 0.001 N nitrate soln. with 0.01 N KNO_3 and contg. pyridine from 0.005 to 2.00 M, at 25°. Air was forced out by H from electrolysis. Half-wave potentials for the cupric ion are const. at +0.04 v. until the pyridine concn. is about 0.5 M, then decrease very rapidly to -0.20 v. This shows the formation of $\text{Cu}(\text{C}_5\text{H}_5\text{N})_6^{2+}$. As the concn. of pyridine increases from 0.005 to 2 M, a second

wave, corresponding to the cuprous ion, appears and becomes more prominent in the polarographic curve. The cuprous ion half-wave potentials decrease steadily with addn. of pyridine, from about -0.1 to -0.47 v. Complexes of Cu^+ with 2, 3, 4, and 6 moles of pyridine are formed. Dissocn. consts. for these are, resp., 48, 3.1, 0.30, and 0.013, each $\times 10^{-4}$. The const. for the cupric hexapyridine complex is 0.1; this larger value shows why there are not lower complexes of cupric ion with pyridine.

Warden Waring

CA

The thiocyanate complex of univalent copper. I. A. Krasnitskiy and N. I. Malyugina (Gorki State Univ.; *Dokl. Akad. Nauk SSSR*, 1950, 1300-1401). In polarography of $\text{Cu}(\text{NO}_3)_2$ in KNO_3 soln., addn. of a small amt. of NH_4CNS gives rise to 2 waves, with the half-wave potentials (relative to satd. calomel) -0.12 and -0.4 v., attributed to $\text{Cu}^{2+} + e \rightarrow \text{Cu}^+$ and $\text{Cu}^+ + e \rightarrow \text{Cu}$, resp. There appears a white ppt., taken to be CuCNS , which dissolves in excess NH_4CNS . Under certain conditions, e.g. with $\text{Cu}(\text{NO}_3)_2$ 0.001 M, NH_4CNS 1.0 N, the polarograms show only one wave, the half-wave potential, ϵ , of which varies with the concn. c of NH_4CNS ; at $c = 1, 2, 3, 4, 5, 6$ N, $\epsilon = -0.82, -0.80, -0.81, -0.87, -0.70, -0.72$ v. At const. c , ϵ remains independent of the temp. between 15 and 42°, whereas the diffusion current increases with the temp. That the reaction between $\text{Cu}(\text{NO}_3)_2$ and NH_4CNS , in the presence of an excess of the latter, actually consists in a reduction of Cu^{2+} to Cu^+ , is borne out by the identity of the polarogram with that obtained in a soln. of CuCl in HCl in the presence of NH_4CNS . A further confirmation is provided by the application of Ilkovich' formula. From the linear graph of ϵ against c , the coordination no. is ~ 4 , i.e. the complex has the compn. $\text{Cu}(\text{CNS})_4$, and a dissem. const. K of 7×10^{-10} . From the fact that ϵ and $\log K$ are independent of temp., it follows that the heat of formation of the complex from its ions is close to 0 kJ.

CA

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the complex of univalent copper with thiocyanate. I. A. Koshunov and N. I. Malyugina (Gorkii State Univ.). J. Gen. Chem. U.S.S.R. 20, 1455-9 (1950) (Engl. translation).—See C.A. 45, 1456d. R. M. S.

KORSHUNOV, I. A.

Lead chloride complexes. I. A. Korshunov and Z. V. Kresnyakova (Gor'ki State Univ.). *Zhur. Obshchei Khim.* (J. Gen. Chem.) 20, 1962-3 (1950).—The compn. of the complexes formed between $Pb(NO_3)_2$ at the const. concn. of 0.004 M, in 0.1 N KNO_3 , and increasing amts. of HCl (up to 6.5 N) was detd. from the displacement of the polarographic half-wave potential $\pi_{1/2}$. With HCl increasing from 0.025 to 6.5 N, $\pi_{1/2}$ (at 25°) changes from -0.4 to -0.6 v., and the diffusion current remains const. From the exptl. plot of $\pi_{1/2}$ as a function of [HCl], the compn. of the complex ion at [HCl] > 3.0 N is $[PbCl_4]^{--}$. Between 0.8 and 2.5 N HCl, the predominating ion is $[PbCl_3]^-$, and this ion is further dissocd. at further decreasing [HCl]. Between 3.0 and 6.5 N HCl, the half-wave potential is, empirically, $\pi_{1/2} = -0.46 - 0.112 \log [HCl]$. With $\pi_{1/2} = 0.4$ v. for the hydrated Pb^{++} ions (measured directly), the instability const. for $[PbCl_4]^{--}$ is found = 0.025. For $[PbCl_3]^-$, the instability const. is found, similarly, = 0.020. Within the accuracy of the measurements (± 0.005 v.), change of the temp. between 0 and 40° has no effect on $\pi_{1/2}$.
N. Thon

KORSHUNOV, I. A.

③
12630 Application of Polarographic Method to the Analysis of Coal-Ash Constituents. I. A. Korshunov, L. N. Sazanova, and R. V. Protsenko. Henry Bratcher, Akademiya, Calif., Translation no. 3257, 6 p. (From Zavodskaya Laboratoriya, v. 13, no. 3, 1947, p. 301-303.)
Determination of Cu, Zn, and Cr. Tables. 6 ref.

[Handwritten signature]
11/24/54

KORSHUNOV, ~~Z. B.~~

1-A

Chm
Polarographic determination of aromatic ketones and aldehydes. I. A. Korshunov, Z. B. Kuznetsova, L. N. Sazonova, and A. S. Kirillova (Gorki State Univ., Zavodskaya Lab. 16, 144-6 (1950). For AcPh, PhCO, p-Me₂NC₆H₄CHO, and BzH only one diffusion wave is seen in acid solns. but raising the pH from 3 to 6 brings up a 2nd wave, which is the only one left when the pH rises above 6. Cinnamaldehyde gives also a 3rd wave which is present at all pH values and changes from -1.40 v. half-wave potential at pH 2.93 to -1.23 v. at pH 0.55. The half-wave potential (against satd. calomel electrode) is as follows: for AcPh -1.07 and -1.6 v.; PhCO -1.1 and 1.45; BzH -1.0 and -1.35; p-Me₂NC₆H₄CHO -0.95 and -1.65; PhCH:CHCHO -0.90 and -1.84 v., resp. Polarographic detns. of these substances are readily performed when alc. solns. of the materials are used, since their soly. in H₂O is poor; 0.1-1.0 N HCl may be satisfactorily used as the solvent in such cases.

G. M. Kosolapoff

CA 6

Lead chloride complexes. I. A. Krasnov, and Z. V. Krasnovskaya (Chukotka State Univ.); *J. Gen. Chem. U.S.S.R.* 20, 2031-3 (1950) (Engl. translation).—See *C.A.* 45, 3740v.
H. L. D.

CA

7

Reduction of acetophenone, benzophenone, and benzoylacetone at a dropping-mercury cathode. I. A. Kuznetsov, A. S. Kirillova, and Z. B. Kuznetsova (Univ., Gorkii). *Zhur. Fiz. Khim.* 24, 561-8(1950); cf. C.A. 43, 6316g. —The half-wave potentials ϵ (referred to satd. HgCl electrode) and the diffusion currents i were determined in 5% EtOH for PhCOMe, 30% EtOH for PhCO, and 50% EtOH for PhCH₂Ac in HCl + KCl, acetate, and phosphate buffers. PhCOMe had one wave ($\epsilon = -1.08$ at pH less than 4.8 and $\epsilon = -1.35$ v. at pH 4.5-5) at pH less than 4.8, two waves between pH 4.8 and 5.6, and only the second wave ($\epsilon = -1.6$ to -1.8 v.) at greater pH. At pH less than 4.8 and more than 5.6, i was proportional to the concn. of PhCOMe (3-16 millimol./l.). PhCO had 2 waves (-1.0 to -1.14 v. and -1.4 to -1.5 v.) at pH 6.5 and only the 2nd wave at pH more than 6.5. The value of i was proportional to the concn. but depended on the buffer. PhCH₂Ac had one wave (in the buffer solns.) whose ϵ was -1.06 , -1.38 , and -1.66 at pH 0.5, 2.3, and more than 4, resp., i was independent of pH at pH less than 5, and decreased linearly to zero when pH increased to 12. In solns. of LiCl, LiOH, and Me₄NCl, PhCH₂Ac had 2 waves. In alk. solns. its i increased with time and was, e.g., at pH 12 as great after 20 days as i of a fresh soln. at pH 7.5. This aging was due to formation of diketo form which in acid solns. forms too rapidly for measurement. In 0.7 N LiOH the const. of this unimol. reaction was 5×10^{-4} sec.⁻¹. J. J. Bikerman.

CA

4

Reduction of phthalimide on a mercury-drop electrode.
 I. A. Karshtunov, O. P. Malkova, and M. K. Shebennikova
 (Gor'kovskii Inst., Gorki). *Zhur. Fiz. Khim.* 24,
 0882-8 (1960).—Phthalimide (I) was reduced on a Hg-
 drop electrode in various electrolytes, e.g. HCl + KCl
 (pH = 1.03), 0.2 N HCl, and buffered solns. of pH 1.06
 and 11.75 to show that in the 1st reduction phase, the half-
 wave potential became more neg. with increasing pH and
 the 2nd phase became more pos., which indicated the
 heterodynamics of these processes since 2 phases could be
 seen in the polarograms. In aq. soln., the rate of cleavage
 of I depends on the compn. of the soln. and its temp.
 and is accelerated by an increase in pH. The activation
 energy at pH 0.1, 0.75, and 11.75 was 17,500, 15,850,
 and 13,200 cal., resp. Paul W. Howerton

KORSHUNOV, I. A.

Polarographic investigation of the kinetics of the formation of isatinic acid. I. A. Korshunov and M. K. Shchennikova (Gor'kovskii State Univ., Gor'ki). *Zhur. Fiz. Khim.* 24, 813-19 (1950). — Isatin was reduced on a dropping-Hg cathode in acid, neutral, and alk. solns., and 4 different diffusion waves with different half-wave potentials were seen. The kinetics of the reduction were studied at several pH values and the rate of the reaction was found to depend on the pH and the compn. of the soln. The energy of activation of the reaction was detd. in various buffered solns. Paul W. Howerton

KORSHUNOV, I. A.

Chem 7

Polarographic determination of the concentration of weak acids. I. A. Korshunov, Z. B. Kuznetsova, and M. K. Shchennikova (Gorki State Univ., Gorki, U.S.S.R.). *Zhur. Anal. Khim.* 6, 66-100 (1961).—The consts. of formic, acetic, isobutyric, isovaleric, chloroacetic, dichloroacetic, trichloroacetic, oxalic, malonic, tartaric, citric, maleic, pyrotartaric, succinic, adipic, benzoic, mandelic, gallic, phthalic, salicylic, acetylsalicylic, anthranilic, sulfanilic, naphthionic, cinnamic acids, *N*-acetylsulfanilamide, sulfathiazole, sulfazole, and *N*-sulfanilil-sulfanilamide, all having 1st disocn. consts. above 10^{-4} were detd. polarographically with a neutral auxillary electrolyte, $N(CH_3)_4I$. Acids having their 1st disocn. const. below 10^{-4} , e.g., sulfidine, sulfanilamide, and boric acid, could not be detd. Between the coeff. of the diffusion current (K_d) and the colog. of the 1st disocn. const. (pK) there is a direct relation expressed by $K_d = 5.25 - 0.725 \text{ pK}$. M. Hoseh

KORSHUNOV, I. A.

183731

USSR/Chemistry - Polarography

Jul/Aug 51

"Brief Communication: Polarographic Determination of Acrolein in Glycerin," A. S. Kirillova, I. A. Korshunov, Gor'kiy State U

"Zhur Analit Khim" Vol VI, No 4, pp 257, 258

Worked out simplified polarographic method for quant detn of acrolein in tech glycerin which is more accurate than method described in OST 539 NK PP. Method uses mixt of glycerin to be analyzed and HCl. Time for detn: 5-10 min.

LC

183731

KORSHUNOV, I. A.

176T31

USSR/Chemistry - Sulfa Drugs

Mar 51

"Polarographic Investigation of Sulfamide Compounds." I. A. Korshunov, A. S. Kirillova, M. K. Shchennikova, L. N. Sazanova, Sci Res Inst Chem, Gor'kiy State U

"Zhur Obshch Khim" Vol XXI, No 3, pp 565-570

Of the compd albucid, sulfathiazole, sulfamethylthiazole, sulfapyridine, sulfadiazine, 4-(p-aminobenzenesulfonamido)-benzene-1-sulfonamide, sulfanilamide, red prontosil, and soluble prontosil, the 1st 6 were reducible at Hg drop electrode, the rest not reducible. Calcd diffusion coeff. Performed polarographic quant

176T31

KORSHUNOV, I. A.

USSR/Chemistry - Cadmium Compounds

Apr 51

"Complexes of Cadmium With Ammonia and Certain Derivatives of Ammonia," I. A. Korshunov, L. V. Lipatova, Chair of Inorg Chem, Gor'kiy State U

"Zhur Obshch Khim" Vol XXI, No 4, pp 615-619

Finds that when Cd ions are reduced in presence of NH_4 , monoethanolamine, triethanolamine, monomethylamine, trimethylamine, complexes are formed whose compn depends on concn of NH_4 , etc. Coordination no of complexes formed ranges from 3 to 6. Ammonium complexes are most stable, methylamine least.

182T13

USSR/Chemistry - Cadmium Compounds

Apr 51

"Polarographic Investigation of Complexes of Cadmium with Certain Monovalent Anions," I. A. Korshunov, N. I. Malyugina, O. M. Balabanova, Sci Res Inst of Chem Gor'kiy State U

"Zhur Obshch Khim" Vol XXI, No 4, pp 620-625

Studies reduction of Cd^{++} ions on Hg drop electrode in solns contg alk halides, free HAl acids, NH_4CNS at different concns. From displacement of Cd 1/2-wave potential, finds coordination no and "const of instability" of complex ions formed. Compn of

182T14

USSR/Chemistry - Cadmium Compounds
(Contd)

Apr 51

complexes depends on concn of salts or free acids. Their stability depends on chem compn and coordination no.

182T14

KORSHUNOV, I. A.

KORSHUNOV, I. A. and KUZNETSOVA, Z. B.

"Polarographic Determination of the Esters of Organic Acids," Zavodskaya
Laboratoriya, No 9, 1952, pp 1075-1079.

APPROVED

U.S.S.R.

77: Radiographic determination of zinc
concentration in the top 50 cm of
the soil. The method
described in this paper
allows for the determination
of zinc, copper, lead, cadmium,
magnesium and selenium in the
soil. The method is based on the

CIA-RDP86-00513R00082501000

KARSHUNOV, I. A.

3

✓ Reduction of mono-, di-, and trichloroacetamide on a dropping mercury electrode. I. A. Karshunov and Z. B. Kusnetsova. *Uchenye Zapiski Gor'kov. Univ.* 24, 25-7 (1983); *Referat. Zhur., Khim.* 1954, No. 35703. — Polarographic behavior of these compds. was studied at 25° with 0.1N solns. of Li_2SO_4 , KOH, and HCl as auxiliary electrolytes. Mono- and dichloroacetamides in Li_2SO_4 and KOH solns. gave 1 reduction curve, and in HCl only the reduction of H^+ could be observed. Reduction of trichloroacetamide in Li_2SO_4 and KOH gave a 3-step curve, the steps being of equal height; in HCl there was only 1 step, the $E_{1/2}$ of which depended on the concn. of trichloroacetamide in the soln. The $E_{1/2}$ of monochloroacetamide in Li_2SO_4 and KOH was -1.78 to -1.80 v. The $E_{1/2}$ of dichloroacetamide in Li_2SO_4 was -1.78 to -1.80 v. and in KOH -1.72 v. The $E_{1/2}$ of the 3 steps obtained in the reduction of trichloroacetamide was -0.30 , -1.25 , and -1.80 v., resp. The diffusion coeffs. of the 3 compds. calcd. with the assumption that 2 electrons participate in the electrode process were 0.80 , 0.84 , and 0.84×10^{-5} sq. cm.²/sec. — The polarographic method was considered suitable for detn. of the 3 compds.

M. Haseh

①

KORSHUNOV, I. A.

③²
 Mechanism of the electroreduction of ketones with conjugated double bonds at the dropping mercury cathode.
 I. A. Korshunov and Yu. V. Vozdinskiy (State Univ. Gorki). *Zhur. Fiz. Khim.* 27, 1162-6 (1953); cf. *C.A.* 47, 5817i. —The half-wave potentials observed in a polarographic study of phorone, mesityl oxide, benzalacetone, benzalacetophenone, and dibenzalacetone were 0.90, 1.05, 0.70, 1.0, and 0.90 v., resp., in a soln. contg. 0.001*N* HCl and 0.2*N* LiCl; 1.52, 1.65, 1.38, 1.20, and 1.38 v., resp., in 0.2*N* LiCl; and 1.64, 1.69, 1.37, 1.30, and 1.40 v., resp., in 0.2*N* LiOH. The no. of electrons used per mol. in the reduction of these substances, calcd. by means of the Ilkovic equation, was 1. The half-wave potentials and the formulas of the reduction products (detd. from mol. wt. and m.p.) were tabulated. The products had twice the mol. wt. of the initial compds. It was shown that the C=O group and not the C=C bond was attacked. J. W. L., Jr.

KORSHUNOV, I. A.

Use of internally filled counters for determination of activity of preparations containing radioactive carbon-14 and sulfur-35. I. A. Korshunov, R. V. Amenitskaya, and B. V. Alvarov. Prikladnoye Mekhanicheskoye Anal. Khim., Akad. Nauk S.S.S.R., Inst. Geokhim. i Anal. Khim. 1955, 219-22. — Detns. were made in a specially assembled app. (described) which comprised a unit for generating CO_2 or SO_2 , purifying the gas, storage units, H and quenching admixts., a manometer, a mixing unit, and a counter tube. The anode of the latter was W, and various materials were used as cathodes. As quenching admixts. were tested vapors of alc., EtBr, pyridine, acetone, etc. Best results were obtained with EtOH and EtBr. For compds. contg. C^{14} (CO_2 , C_2H_6 , pentane, AcH, etc.), a Cu cathode gave the best results. With this cathode and filling the counter with an alc. vapor: CO_2 mixt. of 1:4, the voltage plateau was approx. 350 v. with a slope of 0.5% per 100 v. Admixt. of H lowered the working voltage by approx. 250 v. for each 30 mm. Hg of H. For S^{35}O_2 best results were obtained with an Aquadag cathode. The pressure of S^{35}O_2 in mixt. with alc. vapor and A was 10-30%. The voltage plateau was 100-150 v. with a 2-3% slope. M. Hosh...

(2)

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USSR

Reduction of *m*-nitrobenzenesulfonic acid on a dropping mercury cathode. I. A. Korshunov, I. N. Vertyulius, and N. I. Malozugin (State Univ., Leningrad, USSR, *Dokl. Akad. Nauk SSSR*, 25: 201-4 (1955)). Polarographic reduction of *m*- $\text{O}_2\text{NC}_6\text{H}_4\text{SO}_3\text{H}$ (I) was studied from 0.4×10^{-3} to $1.18 \times 10^{-2} M$ concn. in buffers with pH from 2.03 to 13.0, at 20° ; the potentials were detd. with a satd. calomel electrode as the anode, the potential of this being assumed to be zero for reference. In solns. from acidic to those with pH 8, only 1 diffusion wave was observed, while from pH 8 to 12, 2 waves appeared. In the latter case, from pH 8 to 9.4, the 2nd wave had $1/4$ the height of the total wave, while at pH 9.7-12.0 it was 0.5 of the total wave. Diffusion current was linear in respect to concn. in all cases. In neutral or weakly acidic solns. the diffusion current passed through a min. at pH 4.0; at higher pH values (weakly basic soln.) diffusion current of the 1st wave had a min. at pH 9 while the diffusion current of the 2nd wave passed through a max. at this pH; the max. of the diffusion current of the first wave had a max. at pH 10. These results indicated adsorption phenomena. The half-wave potential up to pH 8.5-9 rose linearly with pH: $E_{1/2} = -0.05 - 0.068 \text{ pH}$; in more basic solns. the half-wave potential of the first wave was relatively const. at about 0.03 v., while the 2nd wave followed the relation $E_{1/2} = -1.88 + 0.1 \text{ pH}$. The 2 values thus merged at about pH 12. The no. of electrons involved calcd. from the Heyrovsky-Ikovic equation was 1 for the 1st wave and 0.4 for the 2nd, indicating possible irreversibility of the electrode reaction. If the reduction actually required 6 electrons, as indicated by many polarographic studies, the calcn. of a diffusion coeff. at pH 2 gave

O. A. Kuznetsov

the value of 0.4×10^{-4} sq. cm./sec., which agreed with the values for similar org. mols. Electrocapillary curves of Hg at pH 4.1 in the presence of I were shown; the influence of I was apparent in the ascending branch of the curve at not too great neg. potentials of the electrode. For estn. of I, the use of KCl was recommended; with 5% EtOH the diffusion wave occurred at a potential near -0.8 to 0.9 v. The resulting amino acid did not interfere. Accuracy of some 5% was possible. Also in *J. Gen. Chem. (U.S.S.R.)* 25, 245-8 (1955) (Engl. translation). G. M. Kosolapoff

KORSHUNOV, I.A.

USSR/Inorganic Chemistry - Complex Compounds.

C.

Abs Jour : Ref Zhur - Khimiya, No 9, 1957, 30307

Author : Korshunov, I.A., Lebedeva, Z.M.

Inst :

Title : Isotope Exchange of Atoms of Iron in Prussian Blue

Orig Pub : Zh. neorgan. khimii, 1956, 1, No 8, 1912-1914

Abst : Study of the temperature dependence of the exchange of Fe(2+) and Fe(3+) atoms between external and internal spheres of prussian blue (I). Preparations of I were obtained from FeCl₂, containing Fe⁵⁹, and K₄[Fe(CN)₆] in solution; precipitate of I was maintained at the predetermined temperature for a definite length of time and was treated with an excess of alkali: $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3 + 12\text{KOH} = 4\text{Fe}(\text{OH})_3 + 3\text{K}_4\text{Fe}(\text{CN})_6$; activity was determined in I precipitated from a solution of Fe(OH)₃ in acid, and from the filtrate after separation of Fe(OH)₃. It was found that at 15-20° no exchange

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USSR/Inorganic Chemistry - Complex Compounds.

C.

Abs Jour : Ref Zhur - Khimiya, No 9, 1957, 30307

takes place in I; at 210° transition of activity amounts to 11%; apparent drop in the magnitude of exchange on further rise of the temperature (5.3% at 245°) is attributed to breakdown of I. The authors note that activity transition in Turnbull's Blue, at elevated temperatures, takes place to a greater extent than in I.

Card 2/2

—95% at -70°) depending on the temperature of

Card 1/3

USSR/Organic Chemistry. Synthetic Organic Chemistry. E-2

Abs Jour: Ref Zhur - Khimiya, No. 8, 1957, 26905.

carboxylation. The solution of 55 g of C_2H_5Br in 180 to 200 ml of pentene is added to the mixture of 7 g of Li and 20 to 30 ml of pentene in the duration of 6 hours, pentene is distilled off and the formed C_2H_5Li is dissolved in 200 ml of n-hexane, the yield is 78%. The solution of 6 g of C_2H_5Li in 250 g of n-hexane is saturated with $C^{14}O_2$ at -70° and under the pressure of 200 to 300 mm, $C_2H_5C^{14}OOLi$ is filtered off, treated with 6 n. H_2SO_4 and the free acid is extracted with ether; yield 95%, boiling point 141° , $n_D^{20} = 1.3875$; radiochemical yield $96 \pm 3\%$. The synthesis of carboxylic acids

Card 2/3

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CIA-RDP86-00513R000825010002

USSR/Organic Chemistry. Synthetic Organic Chemistry. E-2

Abs Jour: Ref Zhur - Khimiya, No. 8, 1957, 26905.

with Li-organic compounds reduces the reaction time considerably, does not require the introduction of a carrier and makes it possible to prepare acids tagged with C^{13} and Cl^{37} .

Card 3/3

K. P. SHVETSKII
 Non-exchange study of some of the complex compounds of
 cadmium and zinc. *Zhur. Neorg. Khim.* 2, 68-72 (1957). The complex
 and the instability constants were determined for complex compounds
 of Zn and Cd with oxalate and citrate ions as well as with
 thiosulfate and citrate ions by the non-exchange method with
 radioactive isotopes. The complexes, which were studied and
 their instability constants are given.

7
 4 E2C

for

KORSHUNOV, I.A.; BATALOV, A.P.

~~Using~~ radioactive sulfur for the study of the concentration process
of rare isotopes of sulfur by the method of chemical exchange.
Zhur. neorg. khim. 2 no.11:2676-2679 N '57. (MIRA 11:3)

L.Gor'kovskiy Gosudarstvennyy universitet im. N.I. Lobachevskogo
Kafedra radiokhimii.
(Sulfur--Isotopes) (Ion exchange)

KORSHONOV, I. H.

✓ Determination of activity of organic compounds contain-
 ing radioactive carbon-14. *Obshchaya Khim.* 27, 898 (1957).
 activity is possible in compds. such as AcOH, MeCOO,
 EtOAc, EtCO₂Et, and EtCO₂Et. The filling gas for the
 count. tube can be CO₂ or Ar. The substances are handled
 in a vacuum train, a diagram of which is shown. Standard
 counting tubes with Cu cathode and W anode are used;
 these are sealed to the vacuum train and are enclosed in Pb
 shells. If the quenching ability of the org. substance is
 insufficient, some 10-20% EtOH can be introduced into the
 system. The accuracy of detns. is $\pm 2\%$. G.M.K.

1-4 E3d
 1-11 E3d
 1-10 E3d
 4 E3d

100
 100

KORSHUNOV, I. A.

27
4E4j-6
/ Determination of solubility of carbon dioxide in aqueous solutions of sulfuric acid by the method of isotopic dilution. M. K. Shestakova, G. G. Devyatikh, and I. A. Korshunov (State Univ., Odesk). *Zhur. Priklad. Khim.* 30, 833-8 (1957).—The soly. of CO_2 obtained from mixts. of NaHCO_3 + $\text{BaCl}_2 \cdot \text{H}_2\text{O}$ with 80% H_2SO_4 in aq. H_2SO_4 was detd. The plots of the soly. N_2 (mole fractions) vs. the concn. C of H_2SO_4 passed through a sharp min. the depth of which decreased as the temp. rose from 20 to 60°. The initial decrease in N_2 , up to $C \approx 30\%$, was ascribed to the electrolytic properties of dil. H_2SO_4 . The max. at about 55% H_2SO_4 and the 2nd min. at about 85% H_2SO_4 were attributed to the effect of the hydrates $\text{H}_2\text{SO}_4 \cdot 4\text{H}_2\text{O}$ and $\text{H}_2\text{SO}_4 \cdot \text{H}_2\text{O}$, resp. The temp. coeff. of N_2 in all solns. was neg. The heat of diln., calcd. from the $\log N_2$ vs. $1/T$ curves decreased as C increased.
I. Benicowitz

KORSHUNOV, I. A., SUBBOTINA, A. I. and GNEZDOV, V. I. (Scientific Research Inst
for Chemistry of Gor'kiy State Univ. im N. I. Lobachevskiy)

"Separation of Iron and Cobalt by Ion-Exchange Chromatography"

Isotopes and Radiation in Chemistry, Collection of Papers of 2nd
All-Union Sci.Tech. Conf. on Use of Radioactive and Stable Isotopes and
Radiation in National Economy and Science, Moscow, Izd-vo. AN SSSR, 1958, 380pp.

This volume publishes the reports of the Chemistry Section of the
2nd All-Union Sci.Tech. Conf on Use of Radioactive and Stable Isotopes and Radiation
in Science and the National Economy, sponsored by Acad. Sci. USSR and Main
Admin for Utilization of Atomic Energy under Council of Ministers USSR,
Moscow, 4-12 April 1957.

KORSHUNOV, I. A. and NOVOTOROV, N. F. (Sci Res Inst for Chem of Gor'kiy State Univ)

"Synthesis of Tagged Organic Compounds and Their Radiochemical analysis"

Isotopes and Radiation in Chemistry, Collection of papers of
2nd All-Union Sci. Tech. Conf. on Use of Radioactive and Stable Isotopes and
Radiation in National Economy and Science, Moscow, Izd-vo AN SSSR, 1958, 380pp.

This volume published the reports of the Chemistry Section of the
2nd AU Sci Tech Conf on Use of Radioactive and Stable Isotopes and Radiation
in Science and the National Economy, sponsored by Acad Sci USSR and Main
Admin for Utilization of Atomic Energy under Council of Ministers USSR
Moscow 4-12 Apr 1957.

KORSHUNOV, I. A.

AUTHORS: Korshunov, I. A., Shafiyev, A. I.

78-1-17/43

TITLE: The Chemical State of Radiophosphorus-32 Formed in Some Targets With Neutron Irradiation (Khimicheskoye sostoyaniye radiofosfora-32, poluchayushchegosya v nekotorykh mishenyakh pri obluchenii ikh neytronami).

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 1, pp. 95-99 (USSR).

ABSTRACT: The above questions concerning radio-phosphorus in the moment of its formation are neglected in spite of a thorough investigation of the nuclear reactions of its production. The choice of the method of isolation of any isotope whatever, especially without carrier, depends, however, on the chemical state of the isotope in the target. The chemical state of the developing radiophosphorus for a number of targets with various chemical and physical properties: CCl_4 , S_2Cl_2 , CHCl_3 , Na_2SO_4 , Na_2SO_3 , $\text{Na}_2\text{S}_2\text{O}_3$, KCNS , NH_4Cl , MgCl_2 , CaCl_2 , etc. was investigated in the present report. The separation of phosphorus in phosphate- and phosphite-ions was carried out according to the methodics of reference 14. The chemical state of phosphorus-32 in CCl_4 . The authors pro-

Card 1/4

APPROVED FOR RELEASE: 06/14/2000

CIA-RDP86-00513R000825010002

The Chemical State of Radiophosphorus-32 Formed in Some Targets With Neutron Irradiation.

78-1-17/43

ved that the whole radiophosphorus from CCl_4 cannot be obtained by ordinary extraction. This was only achieved by re-cooling in the presence of elementary bromine or chlorine under an HNO_3 -solution or of water. Table 1 shows the ratio between the valence forms of radiophosphorus and the percentage of the non-extractible part according to the nature of the extractant. During the formation of radiophosphorus it is adsorbed on the walls of the flask which contains CCl_4 . The quantity adsorbed depends on the water-content in the target (table 2). It hence results that radiophosphorus with large quantities of water (10 ml) especially with acidifying and agitating passes almost completely over to the water layer. With an higher water-content of CCl_4 the adsorption of the formed radiophosphorus increases substantially. The chemical state of the radiophosphorus formed in CCl_4 is influenced by water, gaseous ammonia, chlorine and acetone, if they are added prior to irradiation. The oxygen dissolved in CCl_4 does not have this effect. The duration of the irradiation favors the formation of the pentavalent radiophosphorus (table 5). Table 3 shows that the water-content of the substance of the target favors the stabilization of the radiophosphorus in trivalent state. The formed "hot" radiophosphorus atom can consequent-

Card 2/4

The Chemical State of Radiophosphorus-32 Formed in Some Targets
With Neutron Irradiation.

78-1-17/43

ly form various chemical compounds after the loss of a substantial part of its kinetic energy. If free chlorine is present in the target, considerable quantities of PCl_5 are formed. Part of the phosphorus atoms remains in elementary state or forms non-extractable compounds by means of water. The valency-state of radiophosphorus is changed during its extraction. The chemical state of phosphorus-32 in other targets. Radiophosphorus forms PSCl_2 in a target of S_2Cl_2 with and without the addition of carriers. The chemical state

of radiophosphorus in targets of anorganic salts containing both sulfur and chlorine depends on the oxidative-reductive properties of the respective compound, on the presence of the crystallization water and the thermal treatment prior to and after irradiation. Table 6 contains test-results on the dependence of the valency state of the forming radiophosphorus on the chemical nature of the substance of the target, of the crystallization-water contained therein and of the mentioned treatment. Radiophosphorus forms, together with higher oxidized substances, less oxidized compounds - in compounds with reducing properties. Water favors the formation of higher oxidized compounds. The thermal treatment of the target after its irradiation with neutrons

Card 3/4

Card 4/4

KORSHUNOV, I. A.

78-1-18/43

AUTHORS: Korshunov, I. A., Shafiyev, A. I.

TITLE: The Methods of Isolation of Radiophosphorus From Chlorine- and Sulfur Containing Targets (Metody vydeleniya radiofosfora iz misheney sodержashchikh khlor i seru).

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 1, pp. 100-103 (USSR).

ABSTRACT: The problems of the isolation of radiophosphorus without addition of carriers from targets, besides carbon disulfide, are neglected. Methods of isolation of radiophosphorus without carrier from CCl_4 , CHCl_3 , S_2Cl_2 , NH_4Cl , MgCl_2 , CaCl_2 , Na_2SO_4 , $\text{Na}_2\text{S}_2\text{O}_3$, KCN and other substances, as targets, were investigated in the present report. The isolation by means of an electric field (reference 15) can be applied with the CS_2 -target, but not with the CCl_4 -target. The authors proved that the perfection of the isolation from CCl_4 by means of this method depends on the water content and that it increases from 25 to 50% by using aqueous CCl_4 . The saturation of the CCl_4 with elementary sulfur increases the precipitation of

Card 1/3

APPROVED FOR RELEASE: 06/14/2000

CIA-RDP86-00513R000825010002

78-1-18/43

The Methods of Isolation of Radiophosphorus From Chlorine- and Sulfur Containing Targets.

radiophosphorus on the electrodes up to 75%. The study of the methods of adsorption of the extraction of the radiophosphorus from CCl_4 (table 1) show that silicagel is the best adsorbent.

Further, the adsorption of radiophosphorus on the walls of the irradiation flask can be used for extraction. This is achieved best, if, prior to irradiation, 0.6 to 0.8 ml water per 1.0 liter CCl_4 are added. 80 to 90% of radiophosphorus are adsorbed

on the walls by agitating such a target from time to time. Radiophosphorus can be extracted in a still simpler way by agitating the target during the irradiation and by adding 10 to 20 ml water per 1 liter CCl_4 (approximately 90% radio-phosphorus). The distilling of CCl_4 under a water layer, especially when being acidified with HNO_3 and with a small addition of chlorine makes an 100%

isolation of the radiophosphorus possible. It can be obtained from chloroform in a similar way. Radiophosphorus is obtained from sulfur monochloride best by means of passing the target through a column of air-dried silicagel. Radiophosphorus is desorbed from this by means of water acidified up to 95%. The method of boiling with

Card 2/3

SOV/78-3-9-19/38

AUTHORS: Korshunov, I. A., Subbotina, A. I., Gnezdov, V. I.

TITLE: The Chromatographic Separation of the Ions of Iron and Cobalt
(Khromatograficheskoye razdeleniye ionov zheleza i kobal'ta)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 9, pp 2128-2130
(USSR)

ABSTRACT: The chromatographic separation of the ions of iron and cobalt was carried out with the aid of the radioisotope of iron, Fe^{59} , and of cobalt, Co^{60} . The cationite KY-2 was used as absorbent. The initial solutions have a pH-value of 0,8 - 3. The elution of the iron ions was achieved by means of oxalic acid which forms an oxalate complex with iron. A separation of iron and cobalt is possible by means of the oxalic acid complex of iron. A method of producing radioactive iron oxalate was worked out. The oxalic acid solution of radioactive iron need not contain free oxalic acid. There are 1 figure, 1 table, and 3 references, 3 of which are Soviet.

~~Sci Res~~ *Sci Res Chem. Inst. Dorking State Univ.*

KORSHUNOV, I.A.

Use of polarography in organic analysis. Zav. lab. 24 no.5:543-548
'58. (MIRA 11:6)

(Polarography) (Organic compounds--Analysis)

KORSHUNOV, I. A.

AUTHORS: Korshunov, I. A., Orlova, A. A.

79-1-10/63

TITLE: Radiochemical Investigations of the Reactions of Organo-metallic Compounds in Benzene Solutions
(Radiokhimicheskoye issledovaniye reaktsiy metalloorganicheskikh soyedineniy v benzol'nom rastvore)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 1, pp. 45-47
(USSR)

ABSTRACT: With the aid of a benzene provided with heavy hydrogen atoms Rezuvayev, G. A. and other Russian chemists showed that diphenyl mercury and oxyphenyl mercury behave differently in benzene solutions on radiation in the ultraviolet light. Whereas diphenyl mercury reacts in the direction toward the open radical mechanism, oxyphenyl mercury forms a so-called nucleus of reaction with the solvents. The present paper radiochemically investigated the behavior of these mercury compounds in benzene solutions in the case of photolysis and heating. This method excluded possible errors which are connected with a hydrogen conversion between the organometallic compounds and the deuterated benzene. The

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Radiochemical Investigations of the Reactions of
Organometallic Compounds in Benzene Solutions

79-1-10/63

radiochemical mark was as radiocarbon introduced into benzene where the reaction took place. The radioactive benzene was synthesized according to Zelinskiy from isotopic acetylene which had been produced from isotopic barium carbide. The activity of the initial benzene and the final products was calculated with the aid of a counter with internal filling of carbon dioxide. Previously, the organic compound had been burned to CO_2 in the oxygen current according to the micromethod. The activity calculation was performed with an accuracy to 3%. With the aid of a benzene with carbon isotopes the authors confirmed the mechanism, suggested already earlier, of the photo- and thermo-decomposition of diphenyl mercury and oxyphenyl mercury. It was found that no conversion takes place in the systems diphenyl - benzene, lead tetraphenyl-benzene. There are 2 tables and 4 references, all of which are Slavic.

ASSOCIATION: Gor'kiy State University (Gor'kovskiy gosudarstvennyy universitet)
Card 2/3

KORSHUNOV, I. A.

AUTHORS: Korshunov, I. A., Novotorov, N. F. 79-1-11/63

TITLE: A Radiochemical Calculation of the Number of Carbon Atoms in the Organic Molecule (Radiokhimicheskoye opredeleniye chisla uglerodnykh atomov v organicheskoy molekule)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 1, pp. 47-51 (USSR)

ABSTRACT: In the papers of a number of authors the counter with internal filling was used for the determination of the activity of the compounds. The activity calculation of the compounds, obtained according to the method of isotopic indicators, is feasible by their direct introduction into the interior of the counter tube or as carbon dioxide which forms in the oxygen current after the burning of the organic product. The errors of calculation do not exceed $\pm 1\%$. The high actual efficiency of the calculation permits to determine the specific activities. The present paper points out the possibility to use the above-mentioned counter for the purpose of determining the number of carbon atoms in the organic molecule and for the purpose of the purity

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A Radiochemical Calculation of the Number of Carbon Atoms
in the Organic Molecule

79-1-11/63

determination of the compound obtained according to the method of isotopic indicators. It was shown that the counter with internal filling can be used for the radiochemical calculation of the active carbon dioxide in organic compounds which under the usual conditions have a vapor-tension not below 4 - 5 torr. The comparison of the activities in the calculation of the isotopic compound C^{14} as vapor and as carbon dioxide after its burning permits to determine the total number of carbon atoms in the molecule and the portion of isotopic carbon atoms in it, as well as to determine quantitatively the quantity of admixtures in the organic compound. There are 1 figure and 10 references, 7 of which are Slavic.

ASSOCIATION: **Gor'kiy State University**
(Gor'kovskiy gosudarstvennyy universitet)

SUBMITTED: December 24, 1956

AVAILABLE: Library of Congress
Card 2/2 1. Organic compounds 2. Isotopic counter 3. Chemistry-Theory

5(1, 2)

AUTHORS:

Korshunov, I. A., Vertyulina, L. N., SOV/20-122-6-20/49
Razuvaev, G. A., Corresponding Member, AS USSR,
Sorokin, Yu. A., Domrachev, G. A.

TITLE:

Polarographic Reduction of Some Chromium Aromatic Compounds of Sandwich Structure (Polyarograficheskoye vosstanovleniye nekotorykh khromaromaticheskikh soyedineniy sendvichevogo stroyeniya)

PERIODICAL:

Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 6, pp 1029-1031 (USSR)

ABSTRACT:

While the polarographic behavior of the bis-cyclopentadienyl compounds was described sufficiently in detail (Ref 1), there is one paper only (Ref 2) on the reduction of the cation $((C_6H_5)_2Cr)^+$. As in the laboratory of the authors dibenzene-(I)-, ditoluene-(II), dimesitylene-(III)-and bis-diphenyl chromium-(IV) iodide were prepared, furthermore the dicumene-(V)-and di-(cyclohexyl benzene)-chromium iodides-(VI) not described in publications, it was interesting to study the polarographic reduction of this series of compounds. The synthesis (according to Ref 3) of the above-mentioned

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Polarographic Reduction of Some Chromium Aromatic
Compounds of Sandwich Structure

SOV/20-122-6-20/49

derivatives ((I)-(VI)) is described together with the yields computed and ascertained. From the concentrated solution of dicumene chromium the compound (V) was precipitated as a cherry-red viscous oil by adding saturated aqueous KJ-solution. The authors did not succeed in crystallizing it. (V) is well soluble in low alcohols, acetone, methylene chloride, dichloro ethane, pyridine, dimethyl formamide, whereas it is practically insoluble in ether, CCl_4 , water and benzene.

(VI) is synthesized by a similar method. (VI) was isolated as a dark-red powder from the reaction mixture (with an addition of 50 ml purified n-nonane) by heating for 1.5 hours at 150° . Its solubility in the solvents mentioned in connection with (V) is the same as that of (V). The polarographic investigations of the iodides ((I)-(VI)) were carried out by means of the visual polarograph, which is manufactured by the institute mentioned in the Association. The reduction was carried out on the background of several 0.5 N aqueous electrolytes of lithium chloride, sodium hydroxide, potassium nitrate, sodium sulfate, hydrochloric acid and buffer

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Polarographic Reduction of Some Chromium Aromatic
Compounds of Sandwich Structure

SOV/20-122-6-20/49 .

solutions with pH from 2.3 to 11.75 (Fig 2). The chromium aromatic compounds produce diffusion currents in almost all above-mentioned electrolytes. An exception are hydrochloric acid and the buffer solutions with a pH-value below 2, in which they are precipitated or (e. g. (II)) do not develop any reduction waves. All iodides are reduced within one wave (Fig 1). From the study of the results obtained it can be concluded that the introduction of the alkyl-(V) or cyclohexyl-(VI) substituent into the aromatic nucleus does not exercise considerable influence upon the quantity of the semiwave-potential. In the transition from (II) to (III) the semiwave is shifted only slightly into the direction of the negative values as compared with (I). In the introduction of an aromatic substituent (IV), however, a marked shift of the potential into the range of positive values takes place. For the time being, it is still difficult to reconcile the polarographic results with the data obtained by other methods. The polarographic method, however, can play a certain role in the investigation of the nature of the class of

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Polarographic Reduction of Some Chromium Aromatic
Compounds of Sandwich Structure

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compounds in question. There are 3 figures and 4 references,
1 of which is Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut khimii Gor'kovskogo
gosudarstvennogo universiteta im. N. I. Lobachevskogo
(Scientific Research Institute of Chemistry of the Gor'kiy
State University imeni N. I. Lobachevskiy)

SUBMITTED: June 17, 1958

Card 4/4

KORSHUNOV, I.A.; BATALOV, A.P.; ORLOVA, A.A.

Radiochemical study of radical exchange in certain organo-metallic compounds. Radiokhimiia 1 no.6:679-682 '59.

(MIRA 13:4)

(Radicals(Chemistry)) (Organometallic compounds)

KORSHUNOV, I.A.; NOVOTOROV, N.F.; AMENITSKAYA, R.V.; OKROKOVA, I.S.;
PESTUNOVICH, N.A.; DUBOVSKAYA, V.N.; LEONOV, M.R.; GLAZOV,
V.M.

Synthesis of organic compounds tagged with radioactive carbon. Radiokhimiia 1 no.6:728-733 '59. (MIRA 13:4)
(Carbon--Isotopes) (Organic compounds)

SOV/63-4-1-27/31

5(1, 3)

AUTHORS: Vertyulina, L.N., Korshunov, I.A.

TITLE: Polarographic Determination of Hexaethyldi-Lead in Tetraethyl-Lead (Polyarograficheskoye opredeleniye geksaetildisvintsa v tetraetilsvintse)

PERIODICAL: Khimicheskaya nauka i promyshlennost', 1959, Vol 4, Nr 1, p 136 (USSR)

ABSTRACT: The quantitative polarographic determination of hexaethyldi-lead in tetraethyl-lead is investigated here. Since hexaethyldi-lead is easily hydrolyzed, ethyl alcohol was used as solvent and tetraethylammonium iodide as indifferent electrolyte. Figure 2 shows the direct proportionality between the diffusion current and the hexaethyldi-lead concentration in the solution. If the content is 0.5 to 10%, this relation may be used for the determination of the hexaethyldi-lead content. The average error is 7%.

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There are 2 graphs, 1 table and 3 Soviet references.

SOV/63-4-1-27/31

Polarographic Determination of Hexaethyldi-Lead in Tetraethyl-Lead

ASSOCIATION: Nauchno-issledovatel'skiy institut khimii pri Gor'kovskom gosudarstvennom universitete (Scientific Research Institute of Chemistry at the Gor'kiy State University)

SUBMITTED: June 3, 1958

Card 2/2

SOV/78-4-5-22/46

5(4)

AUTHORS:

Korshunov, I. A., Malyugina, N. I.

TITLE:

The Polarographic Behavior of Zirconium in Aqueous Solution
(Polyarograficheskoye povedeniye tsirkoniya v vodnykh
rastvorakh)

PERIODICAL:

Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 5,
pp 1077-1080 (USSR)

ABSTRACT:

The behavior of zirconium on the mercury drop electrode in solutions of acids and simple salts in the presence of various complex formers was investigated. As initial solution zirconium nitrate (pH ~ 2.5) in which zirconium is present as zirconyl ion, was used. The dependence $E_{1/2}$ and i on the concentration SO_4 and the chlorine ions was investigated and results are given in tables 1 and 2. With an increase of the zirconyl-ion concentration the marginal current and the potential of the semiwave shift towards positive values. It is assumed that the zirconium salts exercise a catalytic influence upon the reduction of the hydrogen ions. With an increase of the sulphuric acid concentration the potential of the hydrogen semiwave shifts towards a negative value with formation of zir-

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5 (3)

AUTHORS:

Korshunov, I. A., Vodzinskiy, Yu. V.
Vyazankin, N. S., Kalinin, A. I.

SOV/79-29-4-69/77

TITLE:

The Reduction of the Derivatives of the α , β -Unsaturated Acids
on the Mercury Drop Cathode (Vosstanovleniye na rtutnom kapel'-
nom katode proizvodnykh α , β -nenasyshchennykh kislot).
I) Derivatives of the Fumaric Acid (I. Proizvodnyye fumarovoy
kisloty)

PERIODICAL:

Zhurnal obshchey khimii, 1959, Vol 29, Nr 4, pp 1364 - 1370
(USSR)

ABSTRACT:

The problem of the influence of the structure of organic com-
pounds on their reducibility on the mercury drop cathode was
often discussed in the publications, the views were, however,
conflicting (e. g. Refs 1,2). As far as the reactivity of the
molecule is determined by the nature of its atoms and the cha-
racter of the bonds between the atoms, by its polarity and po-
larization capacity as well as by other factors, it is obvious
that only an investigation of all these factors may yield a
judgment concerning the easiness of its reduction. Since the
problem of the influence of the structure of organic compounds

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The Reduction of the Derivatives of the α , β -Unsaturated Acids on the Mercury Drop Cathode. SOV/79-29-4-69/77

I) Derivatives of the Fumaric Acid

on the reducibility is important the authors considered it to be natural to determine the dependence of the half cycle potential of the reduction on the conjugation character in the α , β -unsaturated acids and its derivatives. For this purpose the polarographic reduction of a series of derivatives of fumaric acid was investigated. Many authors (Refs 3-5) dealt with the reduction of the fumaric- and maleic acid, their esters and salts on the mercury cathode. These authors determined the potential values and the number of the electrons taking part in the reduction. The data of M. I. Bobrova and A. N. Matveyeva (Ref 6) concerning the reduction of dinitrile of fumaric acid at the mercury drop cathode did not agree with those of the authors, since the authors had no pure products. Hitherto unknown derivatives of the fumaric acid were obtained and characterized: amide, dimethyl amide, diethyl amide, dibutyl amide, diphenyl amide, and the nitrile of β -carbethoxyacrylic acid. The dimethyl- and monoethyl ester, the diamide and dinitrile of fumaric acid as well as the given derivatives of β -carbethoxyacrylic acid were subjected to a polarographic investiga-

Card 2/3

The Reduction of the Derivatives of the α , β -Unsaturated Acids on the Mercury Drop Cathode. SOV/79-29-4-69/77

I) Derivatives of the Fumaric Acid

tion. Ease of reduction diminishes in the series: diphenyl amide > amide > dimethyl amide > diethyl amide > dibutyl amide of β -carbethoxyacrylic acid which is completely in line with the character of the conjugated system of the π -bonds in these compounds. There are 1 figure, 1 table, and 12 references, 5 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut khimii pri Gor'kovskom gosudarstvennom universitete (Scientific Research Institute of Chemistry of Gor'kiy State University)

SUBMITTED: January 24, 1958

Card 3/3

5 (3)

AUTHORS:

Korshunov, I. A., Amenitskaya, R. V., SOV/79-29-6-48/72
Orlova, A. A., Batalov, A. P.

TITLE:

Radiochemical Investigation of the Reciprocal Exchange of the
Radicals in Some Systems (Radiokhimicheskoye issledovaniye
obmena radikalami v nekotorykh sistemakh)

PERIODICAL:

Zhurnal obshchey khimii, 1959, Vol 29, Nr 6,
pp 1992-1995 (USSR)

ABSTRACT:

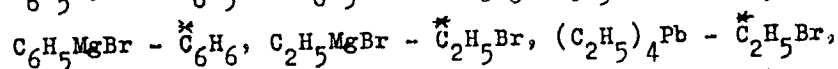
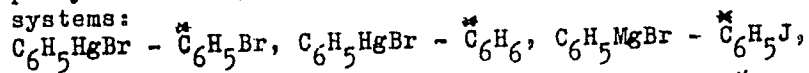
In a previous paper (Ref 1) the reciprocal exchange of the
radicals was investigated in the following systems by means
of the radioactivated isotope C^{14} : diphenyl mercury - benzene,
phenyl mercury hydroxide - benzene, tetraphenyl lead - benzene,
in the heating and irradiation with ultraviolet light. The
analysis of the experimental data shows that the reciprocal
exchange of the radicals takes place according to the open
radical mechanism or over an intermediate formation of
reaction complex with the solvent. Moreover, the degree of the
exchange which depends on the composition of the reacting
system and the conditions of the reactions makes it possible
to determine the mobility of the individual radicals in the
compounds to be investigated. In the present report the

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Radiochemical Investigation of the Reciprocal Exchange of the Radicals in Some Systems SOV/79-29-6-48/72

investigation results of the reciprocal exchange of the phenyl- and ethyl radicals is described for the following systems:



$(C_6H_5)_4PJ - \overset{*}{C}_6H_5J, (C_6H_5)_4PJ - \overset{*}{C}_6H_6$ and $(C_6H_5)_2O - \overset{*}{C}_6H_6$. It is shown that the reciprocal exchange of the phenyl radicals in organomercury compounds and the ethyl radicals in organo-lead compounds takes place only in the presence of additions e.g. cobaltous chloride, aluminum bromide, metallic silver. It was found that the exchange of the phenyl radical in organomagnesium and organophosphorus compounds, with or without additions, does not take place (2 tables). There are 2 tables and 4 Soviet references.

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Dor'kin State Univ.

5(3)

AUTHORS:

Korshunov, I. A., Batalov, A. P.

SOV/79-29-9-69/76

TITLE:

Exchange of Radicals in Organo-metallic Compounds. I. Exchange of Ethyl Radicals in the System Lead Tetraethyl - Ethyl Bromide

PERIODICAL:

Zhurnal obshchey khimii, 1959, Vol 29, Nr 9, pp 3135 - 3139 (USSR)

ABSTRACT:

In many reactions the arrangement of radicals and positive organic ions varies from one molecule to the other (Refs 1-5). Exchange reactions of radicals are also known in organometallic compounds (Refs 6,7). G. Calingaert, H. A. Beaty, and L. Hess (Ref. 8) investigated the mobility of radicals in organo-lead compounds, and it was found that on the exchange in the system $Pb^{*}(C_2H_5)_4 + (C_2H_5)_3PbCl \rightleftharpoons Pb(C_2H_5)_4 + (C_2H_5)_3Pb^{*}Cl$ equilibrium is attained after 24 hours. G. Calingaert, H. Soroos, and V. Hnizda (Ref. 9) proved that the exchange reaction refers to many organo-metallic compounds with different radicals, but only in the presence of various additions (Ref 10). The investigation of this exchange process is of great interest for an interpretation of the mechanism of chemical reactions. It is noted that

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Exchange of Radicals in Organo-metallic Compounds.

SOV/79-29-9-69/76

I. Exchange of Ethyl Radicals in the System Lead Tetraethyl - Ethyl Bromide

investigation of the exchange of equal radicals is only possible by the isotopic method. The authors originally based their paper on this method by investigating systematically the exchange reactions of equal radicals in various organo-metallic compounds. The present paper deals with the possibilities and conditions of an exchange of ethyl radicals between lead tetraethyl and ethyl bromide with the tagged carbon C^{14} . This investigation was made with photo- and thermoreactions under the influence of various additions in various solvents. The exchange reactions did not take place without additions even under photographic irradiation. The presence of small quantities of halogen salts of aluminum and iron, as well as of triethyl aluminum and dimethyl formamide effected a noticeable exchange which may increase up to 20%. Polar solvents stimulate the exchange (for details see the experimental part and the tables). M. M. Skvortsov assisted in the experiments. There are 4 tables and 15 references, 11 of which are Soviet.

Card 2/3

Exchange of Radicals in Organo-metallic Compounds. I. SOV/79-29-9-69/76
Exchange of Ethyl Radicals in the System Lead Tetraethyl - Ethyl Bromide

ASSOCIATION: Nauchno-issledovatel'skiy institut khimii pri Gor'kovskom gosudarstvennom universitete (Scientific Research Institute of Chemistry at Gor'kiy State University)

SUBMITTED: July 19, 1958

Card 3/3